



Galaxy 3000

10-30kVA
Uninterruptible Power Systems

Installation and User Manual

Galaxy 3000

10-30kVA

Installation and User Manual

Revision History

Galaxy 3000 10-3-kVA UPS *Installation and User Manual*

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Proprietary Rights Statement

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IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

– This manual contains important instructions for Galaxy 4000 that must be followed during operation and maintenance of the equipment.



WARNING

Opening enclosures expose hazardous voltages. Always refer service to qualified personnel only.

ATTENTION

L'ouverture des cabinets expose des tensions dangereuses. Assurez-vous toujours que le service ne soit fait que par des personnes qualifiées.

WARNUNG!

Das Öffnen der Gehäuse legen gefährliche Spannungen bloss. Service sollte immer nur von qualifizierten Personal durchgeführt werden.



WARNING

As standards, specifications, and designs are subject to change, please ask for confirmation of the information given in this publication.

ATTENTION

Comme les normes, spécifications et produits peuvent changer, veuillez demander confirmation des informations contenues dans cette publication.

WARNUNG!

Normen, Spezifizierungen und Pläne unterliegen Änderungen. Bitte verlangen Sie eine Bestätigung über alle Informationen, die in dieser Ausgabe gemacht wurden.



NOTE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at user's own expense.



WARNING

To reduce the risk of fire or electric shock, install in a controlled indoor environment free of conductive contaminants.

ATTENTION

This equipment is intended only for installations in a RESTRICTED ACCESS LOCATION.

Pour réduire le risque d'incendie ou d'électrocution, installer dans une enceinte intérieure contrôlée en température et humidité et sans contaminants conducteurs.

Ce matériel est destiné seulement pour des installations dans un EMBLACEMENT RESTREINT D'ACCES.

WARNUNG!

Um die Gefahr von Feuer und elektrischem Schock zu reduzieren, muss das Gerät in einem temperatur- und feuchtigkeitskontrollierten Raum, frei von leitungsfähigen Verunreinigungen, installiert werden. Dieses Gerät ist nur für die Installation an einem Ort mit eingeschränkter Zugangserlaubnis vorgesehen.

Diese Ausrüstung ist nur für Anlagen in einem EINGESCHRÄNKTEN ZUGRIFF STANDORT bestimmt.



WARNING

HIGH LEAKAGE CURRENT. Earth connection essential before connecting supply.

ATTENTION

COURANT DE FUITE ELEVE. Raccordement a la terre indispensable avant le raccordement au reseau.

WARNUNG!

Hoher Ableitstrom Vor Inbetriebnahme Schutzleiterverbindung herstellen.

Certification Standards - Three Phase UPS

- ▶ IEEE 587-1980/ANSI C62.41 1980 Standards for Surge Withstand Ability
- ▶ FCC rules and regulations of Part 15, Subpart J, Class A
- ▶ UL listed under 1778, Standards for Uninterruptible Power Supply Equipment
- ▶ NEMA PE 1 (National Electrical Manufacturers Association) - Uninterruptible Power Systems
- ▶ NEMA 250 (National Electrical Manufacturers Association)
 - Enclosures for Electrical Equipment (1000 Volts Maximum)
- ▶ NFPA 70 – National Electrical Code
- ▶ ISO 9001
- ▶ Occupational Safety & Health Administration (OSHA)

Safety of Persons

- ▶ The UPS has its own internal power source (the battery). Consequently, the power terminals may be energized even if the UPS is disconnected from the AC power source.
- ▶ The UPS must be properly grounded.
- ▶ The battery supplied with the UPS contains small amounts of toxic materials. To avoid accidents, the directives listed below must be observed:
 - Never burn the battery (risk of explosion).
 - Do not attempt to open the battery (the electrolyte is dangerous for the eyes and skin).
 - Comply with all applicable regulations for the disposal of the battery.
 - Batteries constitute a danger (electrical shock, burns). The short-circuit current may be very high. Precautions must be taken for all handling: remove watches, rings, bracelets and any other metal objects, use tools with insulated handles.
 - Do not lay tools or metal parts on top of batteries.

Product Safety

- ▶ Upstream protection must be installed and be easily accessible.
- ▶ The UPS can be disconnected from the AC power source by opening the input protective devices.
- ▶ UPS must be connected to a nearby power source that is easily accessible.
- ▶ Never block the ventilation openings of the UPS.
- ▶ The UPS must be installed in a controlled environment.

Special Precautions

- ▶ The UPS connection instructions and operation described in the manual must be followed in the indicated order.
- ▶ Check that the indications on the rating nameplate correspond to your AC powered system and to the actual electrical consumption of all the equipment to be connected to the UPS.
- ▶ Before and after the installation, if the UPS remains de-energized for a long period, the UPS must be energized for a period of 24 hours, at least once every 3 months (for a normal storage temperature less than 25°C). This charges the battery, thus avoiding possible irreversible damage.

CAUTION: Record All Serial Numbers!

RECORD ALL SERIAL NUMBERS FOR THE GALAXY 3000 AND ACCESSORIES.
THESE SERIAL NUMBERS WILL BE REQUIRED IF YOUR SYSTEM NEEDS SERVICE.
KEEP THIS MANUAL IN A PLACE WHERE YOU CAN REFERENCE THE SERIAL
NUMBERS IF SERVICE IS REQUIRED!

UPS SERIAL NUMBER: _____

BATTERY SERIAL NUMBER: _____

AUXILIARY SERIAL NUMBER: _____

ADDITIONAL SERIAL NUMBERS:

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

NOTES:

Typographical and Symbol Usage

Typographical conventions are designed for ease of use and location of information in procedures.

“< >” angle brackets and bolded text in procedures denote a prompt for User action:

For example: 1. After the selections are complete, click on the <Save> button.

Bold text indicates important names and titles related to the subject of the procedure.

For example: 1. Enter a new document name into the **Name of File** text field.

This manual uses four icon symbols with text to convey important information and tips.



WARNING

Indicates information provided to protect the user and service personnel against safety hazards and/or possible equipment damage.



CAUTION

Indicates information provided to protect the user and service personnel against possible equipment damage.



IMPORTANT

Indicates information provided as an operating instruction, or as an operating tip.



NOTE

Indicates information provided as an operating tip or an equipment feature.

Section Descriptions

Quick Start

This section is a quick start guide to unpack, setup, and make necessary connections before installation of the Galaxy 3000 UPS.

1 Introduction

Provides a general description of the Galaxy 4000 systems intended use, major components, and environmental and mechanical specifications.

2 Setup and Installation

Guides the user through tools and equipment required for unpacking and performing connections required for initial installation. Included are the electrical specifications, environmental recommendations and connection details.

3 Operation

Provides startup, shutdown, and normal operation of the Galaxy 3000 UPS. Included are pre and post startup safety checklists.

4 Maintenance

Describes maintenance and safety information on servicing batteries for the Galaxy 3000.

A Glossary provides definitions of abbreviations and terms used in this manual.

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Getting Started with Galaxy 3000

System Setup describes receiving and handling of the Galaxy 3000, a description of major components, the battery cabinet, and definition of the control panel indicators, which includes electrical, mechanical and environmental specifications.

MGE also recommends obtaining an MGE field service engineer for final installation and basic startup for single and parallel units.



CAUTION

Scheduling of the MGE Field Service Engineers typically should be done 7 to 10 days before they are required on-site. If the startup of the UPS is critical to maintaining your schedule, please call the MGE toll free telephone number at 1-800-438-7373 for assistance. The MGE Field Service Engineers will insure a quick installation for the initial safe startup and configuration of your Galaxy 3000.

Final installation and start-up should be completed by a qualified MGE Field Service Engineer.

First steps by an on-site qualified Technical Engineer

- Step 1. Unpack and position the unit.
- Step 2. Connect the main (utility) power.
- Step 3. Connect the output to the power distribution panel.

Final steps by MGE Field Service Engineer

- Step 4. Call MGE and wait for the MGE Field Service Engineer to complete the installation.
- Step 5. The MGE Field Service Engineer finalizes installation and the startup process.
- Optional: Procedure for temporary power prior to the final startup.

Required Equipment and Tools

The following equipment and tools are recommended for on-site installation:

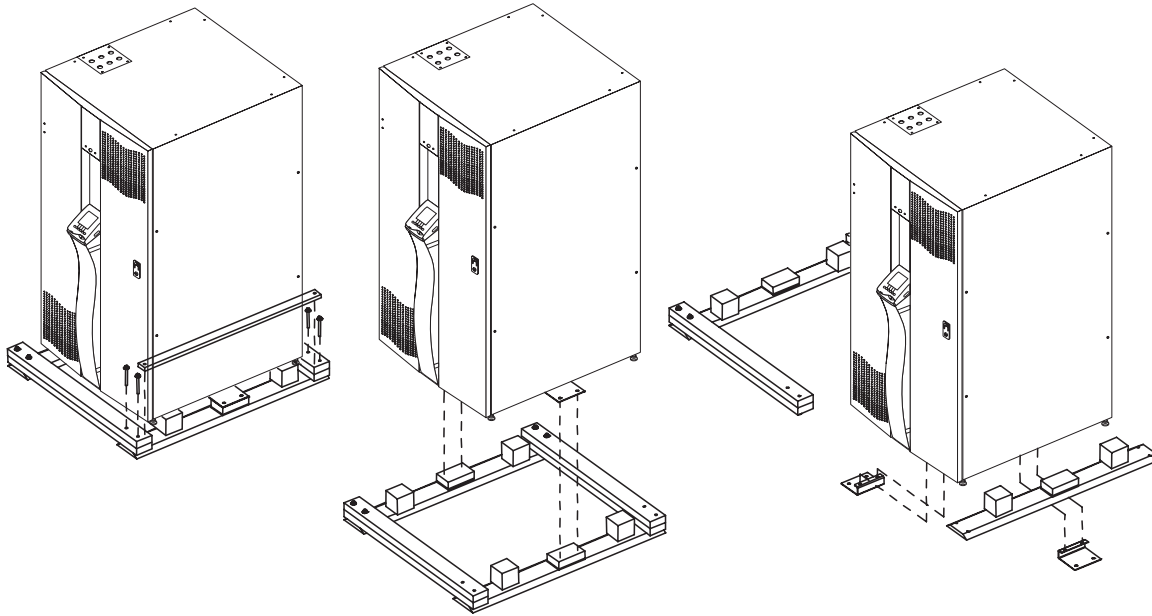
- ▶ Digital volt meter (DVM)
- ▶ 1/8 inch slotted screwdriver
- ▶ Pallet jack/forklift
- ▶ Conduit installation tools
- ▶ Nut driver set

STEP 1 Unpacking and Positioning

This section describes installation of the Galaxy 3000 10-30 kVA UPS, including receiving, handling, and storage procedures; prerequisites to the installation; installation procedures; and start-up procedures.

Once the Galaxy 3000 UPS System has been inspected and received from the shipping courier, the unit should be moved with the use of a fork lift or pallet jack to a position as close to the final installation location as possible.

Figure QS-1: Pallet Mounting Configuration for the Galaxy 3000.



Installation should be performed by a qualified electrician and should conform to local and national electrical codes.

Prior to any installation, the following items should be observed upon receipt of the Galaxy 3000 10-30 kVA UPS. The casters on the unit will allow it to be positioned into the final installation location. At this point, the leveling legs can be adjusted to provide a level and stable footing for the Galaxy 3000 UPS system. See Figure QS-1.

- 1) Inspect shipment for any damage prior to receipt. Damage claims should be filed directly with the courier. Replacements for damaged components should be ordered through MGE Customer Support Services at 1-800-438-7373.
- 2) Move equipment as close to the final location as possible using a pallet jack or forklift.
- 3) Once equipment is close to the installation location, and If configuration is optional pallet mount, remove the Galaxy 3000 UPS from the shipping pallet using extreme caution when rolling the cabinet off the pallet as its weight may exceed 500 lbs. See Figure QS-1.
- 4) All cabinets are equipped with casters allowing the equipment to be placed into final position. Push cabinets very slowly into position to avoid any tipping hazard.
- 5) Once in position, adjust the leveling legs to provide a fixed and stable footing for the Galaxy 3000 UPS system.
- 6) At this point, the UPS system can either be prepared for operation, or for storage until such time as it may be required for service.

STEP 2 Connect the Main Utility Power

All Galaxy 3000 UPS systems provide the option for dual (redundant) utility power inputs. Whether the single or dual inputs are selected, the connection of the utility feed is made to the same terminal block strip in the Galaxy 3000 UPS system.

From the diagram Figure QS-2 below, it can be seen that the main power feed to the Galaxy 3000 system should be connected to the terminal blocks TB1 on the right hand side of the strip. If a bypass AC source is available (and the unit was specified to include a second AC source), this power should be connected to the middle set of terminal blocks TB3.

If the Galaxy 3000 system was specified for a second (bypass) AC source, but a separate power source is not available, then jumpers should be installed from the primary AC source to the terminal blocks for the bypass AC source.

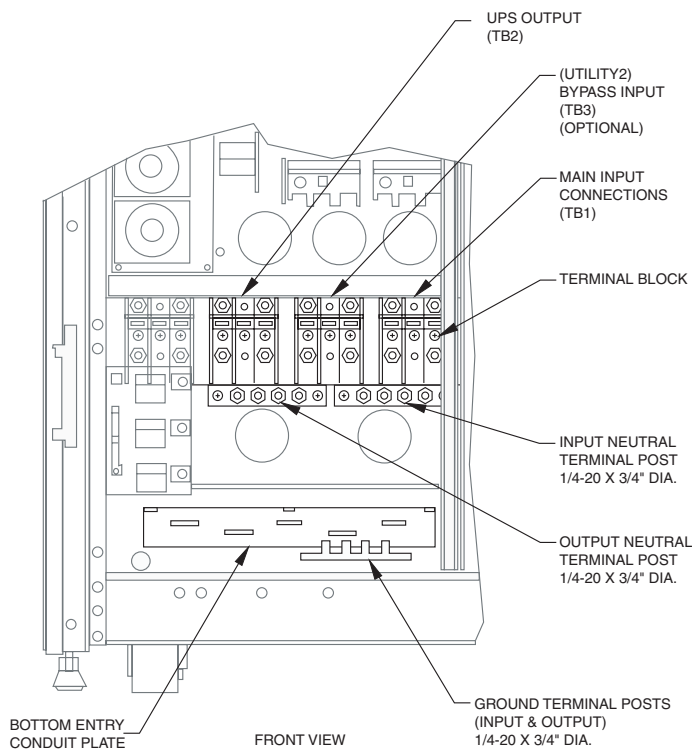


NOTE

The three phase power should be supplied as a Wye with a separate neutral that will be connected to the input neutral busbar.

If the second (bypass) AC source is provided from a source other than that of the main input, it is recommended to use isolation transformers so that the neutral of both AC sources can be grounded to the same potential.

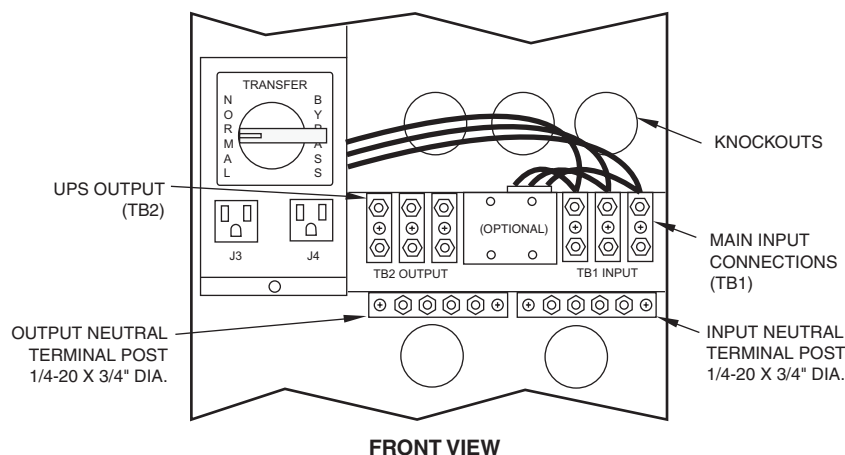
Figure QS-2: Utility Power Connection.



STEP 3 Connect the Output to the Distribution Panel (Load)

The Galaxy 3000 UPS system offers a standard 208 VAC output voltage. Optionally, a transformer can be provided in an auxiliary cabinet that will provide 240 VAC, 480 VAC or 600 VAC for the output.

Figure QS-3: Terminal Blocks.



The output from either the Galaxy 3000 cabinet or from the external auxiliary transformer cabinet should be wired to the existing power distribution panel, or to an appropriate power management panel.

The output from the Galaxy 3000 UPS system should be connected to the left most set of terminal blocks (see Figure QS-3.).



STEP 4 Call MGE UPS Systems for Field Engineer Service

Call MGE Field Engineer Service support at **800 438-7373** to finalize the installation of the unit.

STEP 5 Arrival of MGE Field Engineer

The MGE Field Engineer will finalize the initial Galaxy 3000 UPS start-up. To insure a successful installation and reliable UPS service, the MGE Field Engineer will verify all of the installation connections, fusing, and then will examine the extensive set of Galaxy 3000 UPS personalization parameters to insure that the operation of the UPS exactly matches your installation requirements.

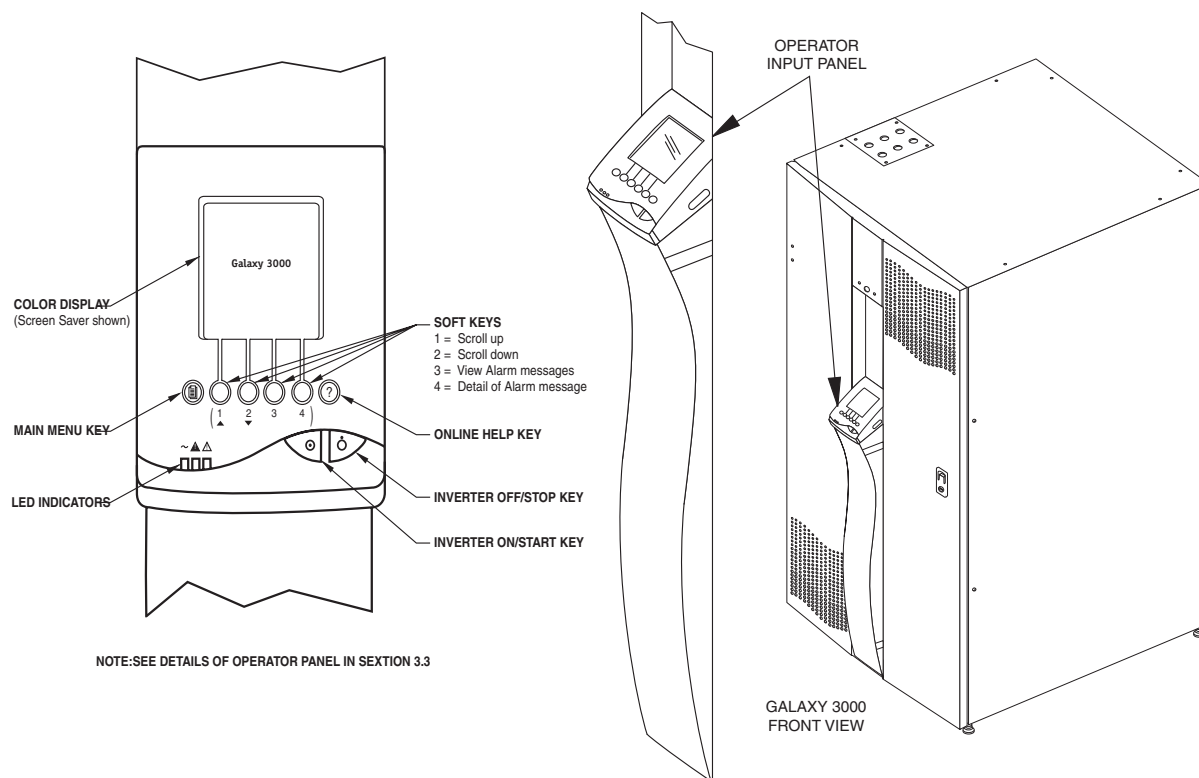
Operator Interface Panel

The Galaxy 3000 system is simple to operate and yet provides a wealth of continuous monitoring and diagnostic features to insure the proper operation of the unit.

Operators gain access to information in the Galaxy 3000 system through the operator interface. This display panel and keyboard is conveniently located on the front of the UPS cabinet see Figure QS-4.

Operator Interface - The Galaxy 3000 Operator Interface provides an easy to use method to access and control the Galaxy features. Through the use of four (4) "soft" keys and four (4) dedicated purpose keys, the operators can quickly move through the available displays, and control the performance of the unit.

Figure QS-4: Operator Input Panel.



Quick Start Notes

If AC power is required on site prior to the arrival of the MGE Field Engineer, the following procedure will provide the AC power without powering the UPS. Any questions about this procedure contact the MGE Field Service support line at 800 438-7373.

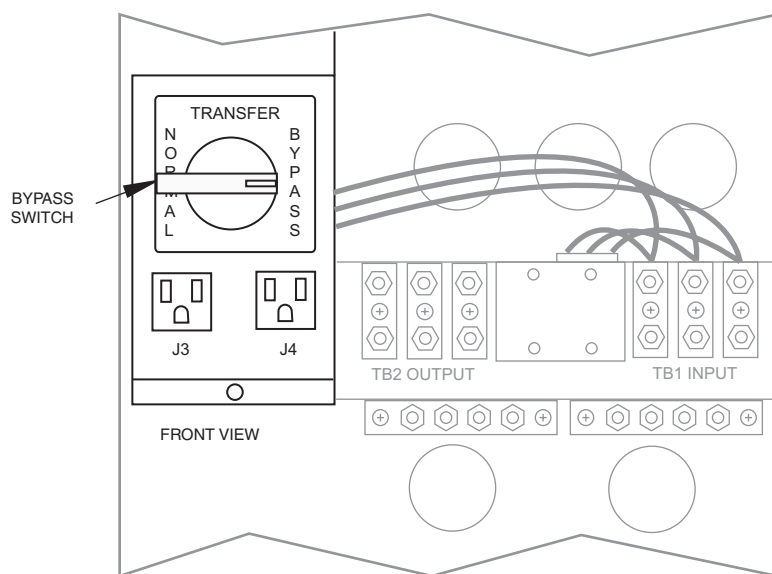
- A. Insure that the Bypass Switch is in the BYPASS position.
- B. Insure that the battery breaker, QF1, is open.
- C. Close the input power breaker to energize the AC power.
- D. At this point, power will be available for site usage until the UPS is properly commissioned.
- E. Upon arrival of the MGE Field Service Engineer, the main power must be disconnected so that a safe and proper commissioning of the unit may be accomplished.



WARNING

Do not, under any circumstance, rotate the switch to the TRANSFER or NORMAL position, or close the battery breaker, QF1, until the unit has been commissioned by an MGE Field Engineer.

Figure QS-5: Bypass Switch Set to Bypass Mode.



1.0 Scope

Provides a general description of the Galaxy 3000 systems intended use, major components, and environmental and mechanical specifications.

1.1 General Description

The Galaxy 3000 is the world's first data center grade Uninterruptible Power Supply system designed specifically for mid-range enterprise level applications. The Galaxy 3000 family consists of units available in power ratings from 10 - 30 kVA, and are optimized for compatibility with nonlinear computer-type loads.

By incorporating the Ultra High Availability Topology (UHAT), the Galaxy 3000 family of UPS systems are designed to provide the optimal level of reliability and to react to any power disturbance in an inherently safe way to protect the critical load. The Galaxy 3000 all-in-one design incorporates every feature into one compact cabinet, including a graphical user interface, power factor corrected input, batteries, and communication cards that support network based power management.

The Galaxy 3000 UPS and its auxiliary equipment are designed for installation in a room where humidity and temperature can be controlled. The recommended and maximum environmental parameters are listed in Appendix A, Specifications, of this document.

The Galaxy 3000 UPS and auxiliary equipment is listed for safety by Underwriters Laboratories, Inc. (UL) under UL Standard 1778 - Uninterruptible Power Systems; and also listed by Underwriters Laboratories (CUL) under Canadian Standards Association (CSA) standard C22.107.

Figure 1-1: Galaxy 3000 UPS Systems.



1.1.1 Major Components

Rectifier	Converts AC input voltage to DC voltage. The rectifier uses IGBT (Insulated Gate Bipolar Transistor) power transistors and a Pulse Width Modulated (PWM) technique to provide input power factor correction and to minimize any harmonic reflected onto the input power lines.
Inverter	Converts DC voltage from the rectifier or from the batteries into AC output voltage to maintain the attached load. This module uses the IGBT technology to provide digital power quality.
Static Switch	Automatically supplies the attached load from the bypass source when the inverter is off.
Battery System	Stores energy for utilization by the inverter and attached load in the event that utility AC power is lost or is of unacceptable quality.

1.1.2 Galaxy 3000 Micro and Standard Cabinets

The Galaxy 3000 UPS system is available in two different cabinet sizes, the Micro cabinet and the Standard cabinet. Dimensions for the cabinets are:

- ▶ Micro cabinet: 48.6in (1234.4) H x 23.0in (584.2) W x 38.1in (967.7) D
- ▶ Standard cabinet: 62.5in (1587.5) H x 32.8in (833.12) W x 40.1in (1018.5) D

Both cabinets are designed to provide for top and bottom entry of the utility power feed. The Micro cabinet is typically supplied assuming bottom entry only.

Operating internally on 208 VAC, the Galaxy 3000 UPS system can be purchased to accept 208 VAC, 220 VAC, 480 VAC, or 600 VAC utility feed with the use of an internal input transformer contained in a Standard cabinet. The Micro cabinet was designed to provide all of the features of the Galaxy 3000 system in the smallest possible enclosure. Without an auxiliary cabinet, the Galaxy 3000 system in a Micro cabinet provides only 208 VAC input and 208 VAC output.

An output voltage of 208 VAC is standard with the Galaxy 3000 and does not require any additional cabinetry. If output voltages of 240 VAC, 408 VAC or 600 VAC are required, an auxiliary cabinet is required for the output transformer.

The complete list of additional cabinets that could be included with your Galaxy 3000 system are: External Maintenance Bypass cabinet, extended battery cabinet, and distribution cabinets.

1.1.3 Preparation for Operation

Several items must be considered when preparing the Galaxy 3000 UPS system for operation.

First – The UPS cabinet and its auxiliary cabinets must be arranged in the required configuration to insure that the interconnection cables are located in the correct adjacent cabinets.

Second – The cabinets must be in a location that provides for proper air flow and heat rejection.

Third – The room in which the Galaxy 3000 UPS system is located must maintain environmental conditions within recommended tolerances

Forth – All electrical connections must utilize the top or bottom conduit entries provided.

The following sections discuss in more detail these items.

1.1.4 Cabinet Descriptions and Placement

The complete UPS system may consist of one to four cabinets depending on the options selected. The UPS will be housed in either a "Standard" or "Micro" cabinet. The Micro cabinet is offered for applications where space is at a premium, while the Standard cabinet is offered for either larger kVA requirements or for applications with input transformer requirements. For the Micro cabinet to achieve the maximum space savings, the configuration must be offered with a minimum number of options. The Micro cabinet based Galaxy 3000 is available where the input/output voltage is 208/208 VAC and options such as an external maintenance bypass, output distribution, input isolation or extended batteries are either not required or are accomplished with existing auxiliaries or third party solutions. The Standard Cabinet allows all such system options to be selected based on the application. When facing the Galaxy 3000 UPS from the front, the standard arrangement provides for any external batteries to be located on the right hand side, and all other auxiliary cabinets to be located on the left hand side of the UPS.

1.1.5 Cabinet Clearance and Environmental Requirements

1.1.5.1 Air Flow / Heat Rejection

The Galaxy 3000 UPS cabinets generate heat and exhaust air through the top portion of its enclosures. Air intake is through the bottom of the cabinet. All other cabinets are convection cooled. To assist you in planning for your HVAC needs, heat rejection data is provided in Table 1.1, (i.e., 480 VAC input / 480 VAC output).

1.1.5.2 Recommended Operating Environments

The Galaxy 3000 is intended for use in an environment where control of temperature and humidity is provided. The Cabinet airflow and recommended top clearance are provided in Figure 1-2.

Table 1-1: Heat Rejection Data.

Heat Rejection Data @ 480/480 VAC	
UPS Module	BTU/Hr
10 kVA	6,824
15 kVA	10,235
20 kVA	12,965
30 kVA	19,447

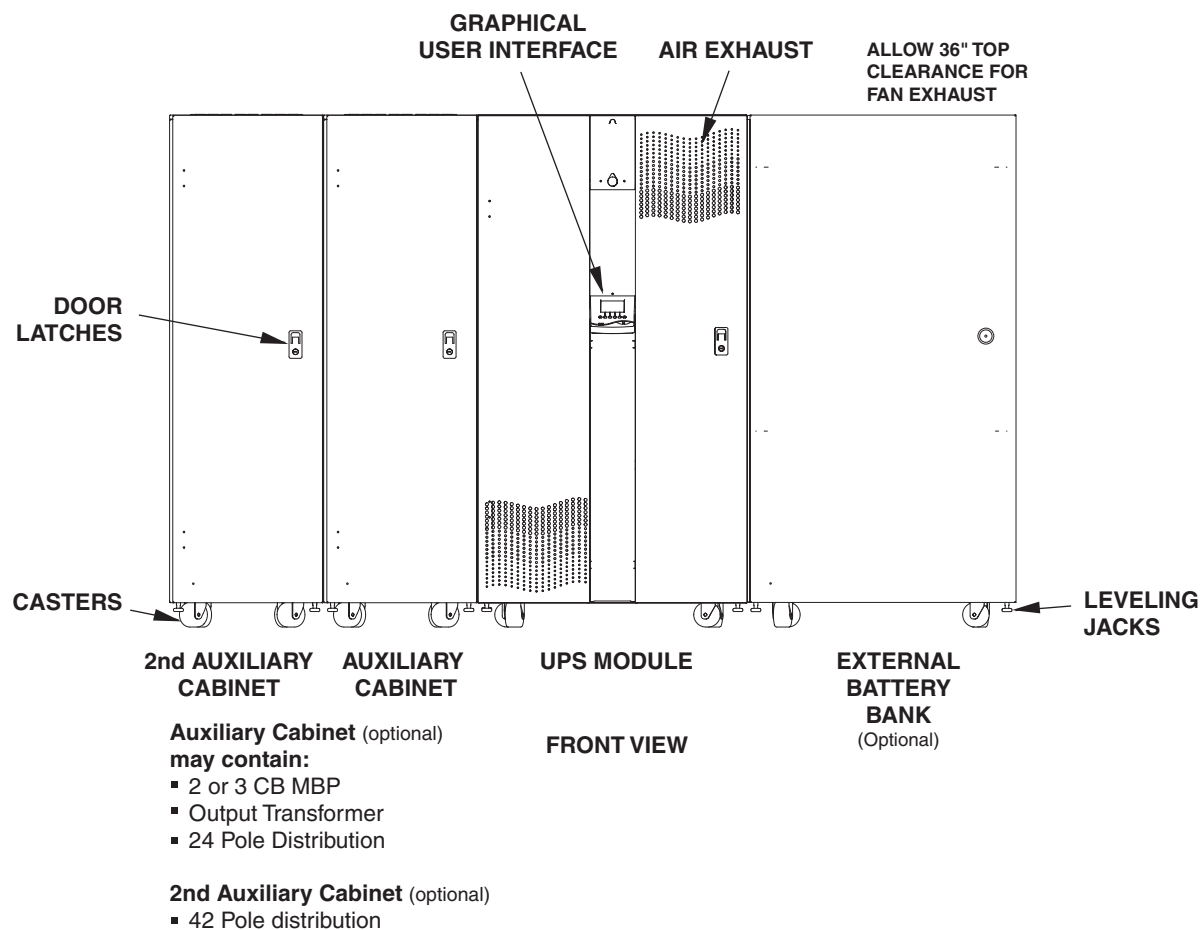
See section 2.1 Electrical Specifications for specific Heat Rejection data based on kVA sizing and voltage requirements.



NOTE

To provide for adequate ventilation, a minimum of 36in (914.4) clearance should be maintained above the top of the Galaxy 3000 cabinet.

Figure 1-2: UPS Cabinet Showing the Airflow and Recommended Clearance.



Introduction

1 — 5

To provide for adequate ventilation, a minimum of 36in (914.4) clearance should be maintained above the top of the Galaxy 3000 cabinet.

1.2.3 Single Line Diagram

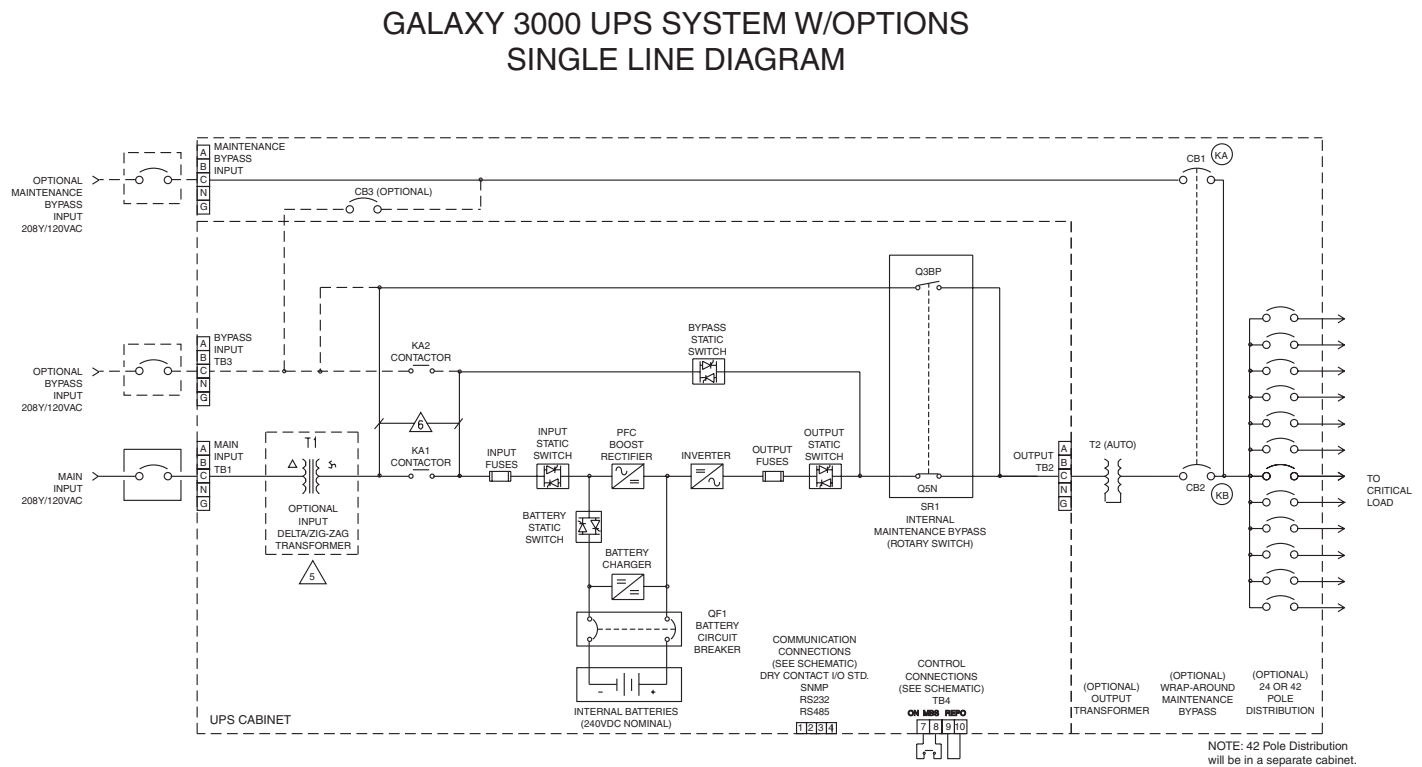
During normal operation, the utility power (Main input) is supplied to the UPS rectifier. The rectifier converts the AC power to DC that is supplied to the inverter. The inverter converts the DC voltage to three-phase regulated AC voltage, which is supplied to the attached load.

During power failure conditions, the inverter is supplied by the stored energy in the battery system, and the load is powered continuously with no interruption.

The Galaxy 3000 UPS is designed for internal operation of 208 VAC input and output. When different input and/or output voltages are specified, transformers (either internal to the standard cabinet, or external to the micro or standard cabinet) provide step-up/down functions as required.

Additional (extended life) batteries, external maintenance bypass switches, and/or output distribution panel boards may be contained in auxiliary cabinets similar in design to the Galaxy 3000 cabinet, or may be contained in third party cabinets or wall mounted units.

Figure 1-4: Galaxy 3000 UPS System - Single Line Diagram.



1.3 Preparation for Storage

If the equipment is to be stored prior to installation, it should be stored in a cool, dry, well-ventilated location that is protected against rain, splashing water, chemical agents, etc. The equipment should be covered with a tarpaulin or plastic wrapper to protect it against dust, dirt, paint, or other foreign materials. See the section of this manual titled "Specifications" for recommended storage environmental conditions.



NOTE

Batteries should be stored no longer than three (3) months at 25° C (77° F) or lower prior to recharging. Exceeding the recommended ambient storage temperature will reduce battery back-up time and may adversely affect battery life.

2.0 Scope

Guides the user through tools and equipment required for unpacking and performing connections required for initial installation. Included are the electrical specifications, environmental recommendations and connection details.

The following describes installation procedures and recommendations for the Galaxy 3000 10-30 kVA UPS including receiving, handling, and storage procedures. Prerequisites prior to installation; installation procedures and start-up procedures are also included.

2.1 Electrical Specifications

Environmental Recommendations

Recommended environment	20° to 25° C (68° to 77° F.); 50% relative humidity; computer room or other temperature- and humidity-controlled environment
Operating temperature	0° to 40° C (32° to 104° F.) except battery
Storage	-20° to 50° C (-4° to 122° F.)
Humidity	up to 90% non-condensing (operating)
Altitude	sea level to 3,000 meters without derating
Acoustic noise	78 dBA Acoustic noise at rated load as measured 5 feet from the front of the UPS module

Table 2-1: Electrical Specifications for the Galaxy 3000.

	10 kVA					15 kVA				
Output Power Rating (0.8 PF)	208/208	220/220	480/208	480/480	600/208	208/208	220/220	480/208	480/480	600/208
UPS Voltage (input / output)	Three Phase, Three Wire + N + G 60 Hz									
Input / Output Requirements & Frequency	A,B,C Clockwise									
Input Phase Rotation	>.98									
Input Power Factor										
Max. Nominal Input Current (-15% Input Line at 100% Load)	31 A	31 A	14 A	14 A	11 A	46 A	46 A	21 A	21 A	17 A
Output Current	28 A	26 A	28 A	12 A	28 A	42 A	39 A	42 A	18 A	42 A
DC Voltage	198 VDC End Voltage 240 VDC Nominal 277 VDC Max. Maintenance Voltage									
Max. Battery Current at Nominal Battery Voltage (240 VDC at 100% Load)	39 ADC	41 ADC	39 ADC	41 ADC	39 ADC	59 ADC	61 ADC	59 ADC	61 ADC	59 ADC
Max. Battery Current at Battery End-Voltage (198 VDC at 100% Load)	48 ADC	49 ADC	48 ADC	49 ADC	48 ADC	71 ADC	74 ADC	71 ADC	74 ADC	71 ADC
Battery Disconnect Current	63 A (7 min. back-up time) 70 A (>7 min. back-up time)									
Max. System Heat Generation (BTU/hr)	4777	6824	5800	6824	5800	7165	10235	8871	10235	8871
SR1 Maintenance Bypass and Isolation Switch Rating	50 A	50 A	50 A	50 A	50 A	50 A	50 A	50 A	50 A	50 A
Input / Output Fuse Current	70A	70A	70A	70A	70A	70A	70A	70A	70A	70A
Input and Optional Bypass Contactor Current	40A	40A	40A	40A	40A	40A	40A	40A	40A	40A

	20 kVA					30 kVA				
Output Power Rating (0.8 PF)	208/208	220/220	480/208	480/480	600/208	208/208	220/220	480/208	480/480	600/208
UPS Voltage (input / output)	Three Phase, Three Wire + N + G 60 Hz									
Input / Output Requirements & Frequency	A,B,C Clockwise									
Input Phase Rotation	>.98									
Input Power Factor										
Max. Nominal Input Current (-15% Input Line at 100% Load)	61 A	61 A	27 A	28 A	22 A	91 A	91 A	41 A	42 A	33 A
Output Current	56 A	53 A	56 A	24 A	56 A	83 A	79 A	83 A	36 A	83 A
DC Voltage	198 VDC End Voltage 240 VDC Nominal 277 VDC Max. Maintenance Voltage									
Max. Battery Current at Nominal Battery Voltage (240 VDC at 100% Load)	78 ADC	80 ADC	78 ADC	80 ADC	78 ADC	116 ADC	120 ADC	116 ADC	120 ADC	116 ADC
Max. Battery Current at Battery End-Voltage (198 VDC at 100% Load)	94 ADC	97 ADC	94 ADC	97 ADC	94 ADC	141 ADC	146 ADC	141 ADC	146 ADC	141 ADC
Battery Disconnect Current	125 A									
Max. System Heat Generation (BTU/hr)	8871	12965	10918	12965	10918	13306	19447	16377	19447	16377
SR1 Maintenance Bypass and Isolation Switch Rating	100 A	100 A	100 A	100 A	100 A	100 A	100 A	100 A	100 A	100 A
Input / Output Fuse Current	125A	125A	125A	125A	125A	125A	125A	125A	125A	125A
Input and Optional Bypass Contactor Current	110A	110A	110A	110A	110A	110A	110A	110A	110A	110A

* NOTE: Interrupted Transfer to Bypass Source:

If the bypass source is beyond the conditions stated below, the UPS will make an interrupted transfer (not more than 500 msec. in duration).

1. Bypass voltage greater than +10%, -10% from the UPS rated output voltage.
2. Bypass frequency greater than ± 2 Hz from the UPS rated output frequency.

2.2 Electrical Connections



CAUTION

Only an authorized electrical professional should access electrical connections. A severe shock hazard exists.

The ONLY user serviceable items in the Galaxy 3000 unit are:

- A. The main and bypass power connections
- B. The load connection
- C. Any cable connection to external or auxiliary module
- D. The communication card options

The access method for connections made to the communication cards is clearly seen when the front door to the Galaxy 3000 unit is opened. However, access to the main, bypass and load connections is made through the removal of the safety panel located in the lower left of the Galaxy 3000 (with the door open). This safety panel is removed by first removing the four (4) screws securing the panel. It can then be removed by lifting the safety panel away from the unit.

2.2.1 Electrical Connections (UPS Module)

Electrical connections and cabinet interconnection will vary depending upon the configuration and options selected with your Galaxy UPS system. Refer to the installation drawings supplied with your equipment.

Connecting Power Cable Connections to access the connection terminal blocks, open the door to the Galaxy 3000 UPS. Remove the safety panel located in the lower left hand section of the unit. See Figure 2-1.

- a. The ground conductors must be connected to the ground terminal posts.
- b. Connect the three conductors of the Normal AC source to terminal block TB1.
- c. If bypass terminal block is present, connect the conductors of the Bypass AC source to terminal block TB3.
- d. Connect the four conductors supplying the load to terminal block TB2.
- e. Secure all cables with cable ties.
- f. Put all panels and covers back in place.

2.2.1.1 Main AC Input Connections

The connections to be made are the three phases, and ground cables from the utility AC power source to the UPS. The main AC input cables are terminated at the Main Input Terminal Blocks (TB1). Complete wiring instructions for your installation are provided on the installation drawings supplied with the equipment.

2.2.1.2 Bypass AC Input Connections (optional)

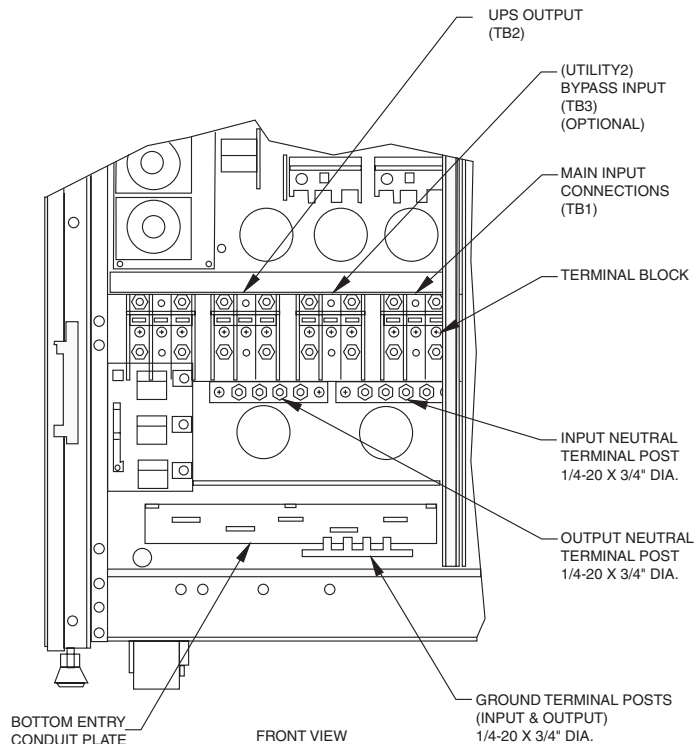
The connections to be made are the three phases, and ground cables from the bypass AC input power source to the UPS. The bypass AC input cables are terminated at the Bypass Input Terminal Blocks (TB3) if present. This option provides a separate AC input source for bypass operation.



CAUTION

Before making any electrical connections, verify that all battery disconnect circuit breakers (QF1) are in the "off" position. Customer-supplied upstream protective devices and distribution circuits should be OFF.

Figure 2-1: Typical Power Connections.



2.2.1.3 AC Output Connections

The connections to be made are the three phases, and ground cables from the load source to the UPS. The output cables are terminated at the Output Terminal Blocks (TB2) for 15 kVA small module, and input/output connections for 10-30 kVA large module. Load cables must be run separately from all other cables (power supply or computer-system interconnection cables). They should not pass near interference-emitting equipment or sensitive loads.

2.3 Connecting Remote Emergency Power Off Cables









The control connections are available for Remote Emergency Power Off (REPO) through a customer-supplied normally closed pushbutton. With REPO connected, the jumper on the REPO terminal blocks must be removed. The UPS is also equipped with a local Emergency Power Off button on the front of the UPS cabinet. See Figure 2-1.

1. Remove the jumper from terminal block TB4 located across terminals 7 and 8.
2. Connect the emergency power off NC contact to terminals 7 and 8.

2.3.1 Connection of Relay Communication Card

The relay communications card contains six programmable dry contact outputs and two programmable dry inputs and is standard on the Galaxy 3000. The inputs and outputs are factory programmed according to functions listed in Table 2-2.

Table 2-2: Relay Contacts (communications card).

Inputs	Factor Setting	Options (available on both contacts)
1.A 	UPS ON	- Room temperature fault - Transfer to bypass disabled
1.B 	UPS OFF	- Transfer to bypass disabled if Bypass AC source out of tolerance - Desynchronize UPS from Bypass AC source
Outputs	Factor Setting	Options (available on all contacts)
1.1 	General alarm	- Overload - PFC fault
1.2 	Battery fault	- Inverter fault - Charger fault - Automatic-bypass fault
1.3 	Load on UPS	- Bypass AC source out of tolerance - Battery-temperature fault - Fan fault
1.4 	Load on automatic bypass	- Emergency power off activated - Battery circuit breaker(s) open - Phase-sequence fault on Normal or Bypass AC source
1.5 	Load on battery power	- Blown fuse(s) - Transfer to Bypass AC source disabled
1.6 	Low battery warning	- Operation in ECO mode - UPS on Bypass AC source

The indications 1.X become 2.X for a second card of the same type.



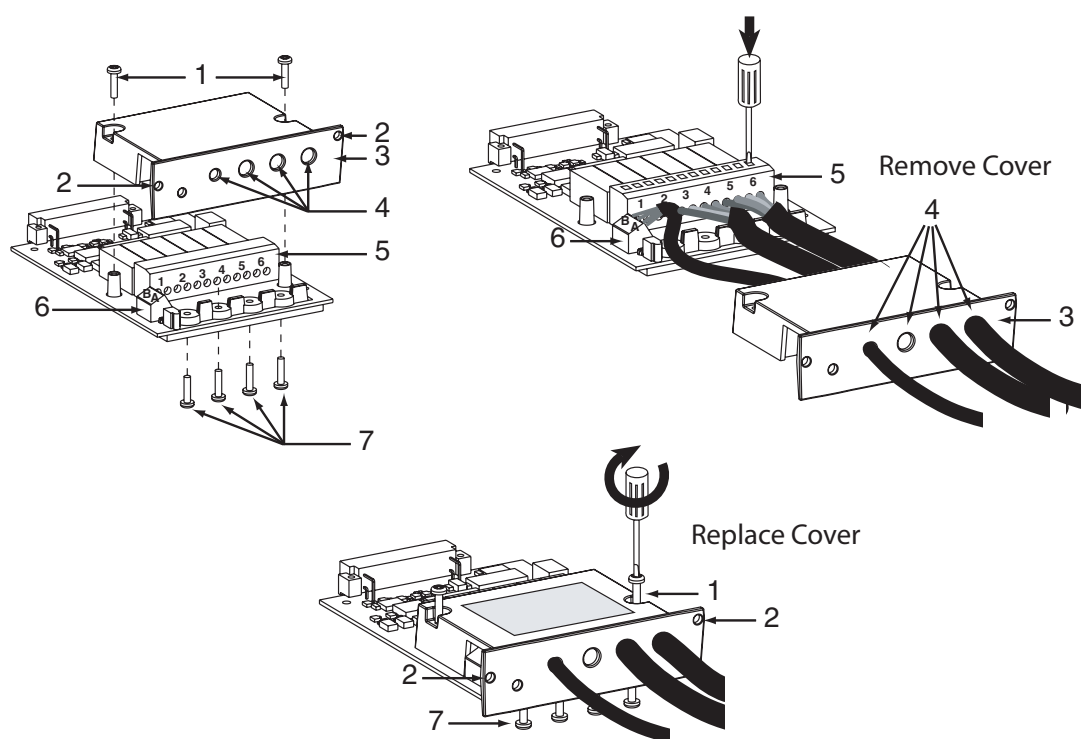
CAUTION

Isolate and lock-out all power sources for this card before making connections. Never connect ELSV (extra low safety voltage) and non-ELSV circuits to the different outputs of the same card.

2.4 Removing the Cover

1. Remove the cover “3” secured by the screws “1”.
2. Run the communications cables through the cable entry holes “4”.
3. Connect the conductors to the input “6” and output “5” terminal blocks (see connection example in diagram below).

Figure 2-2: Remove Cover Diagram.



2.4.1 Replacing the Cover

1. Put the cover back in place and secure it with the screws “1”.
2. Tighten the screws “7” to block the cables.
3. Indicate the locations of the power sources on the labels.
4. Insert the card in its slot.
5. Secure the card with two screws “1”, “2”.

2.4.2 Characteristics of the Output Contacts

Relay Type:	Normally Open.
Max. voltage:	250 V AC, 30V DC.
Max. current:	2 A.
Cable:	4 x 0.93 mm ² , $\pm 6.6 \pm 0.3$ mm.

2.4.3 Characteristics of the Input Contacts

Switched voltage:	5 V DC.
Consumption:	10 mA.
Cable:	4 x 0.34 mm ² , $\pm 5 \pm 0.5$ mm.

Output alarms are always activated on the conditions stated unless requested by customer to operate on other conditions.

Input contacts are designed for remote UPS operation. Use extreme caution when using these contacts so as not to endanger persons or compromise the UPS load.

2.5 Check Points Before and After Start Up

Before starting the Galaxy 3000, be certain that you fully understand the operation of the indicators, controls, and operational sequences. MGE UPS SYSTEMS offers professional start up services in most countries. It is suggested that before applying power to your Galaxy 3000, your contract with MGE for a professional start up with an MGE Field Engineer.

Pre-Start Up Safety Check List:

- ▶ All power and control wires have been properly connected and securely tightened.
- ▶ The upstream and downstream protective devices are not tripped, and have been sized properly for the UPS and load requirements.
- ▶ The input voltage is the same as indicated on the UPS nameplate, located inside the door of the Galaxy 3000 UPS module.
- ▶ Make certain that no objects block the air intake underneath and around the front bottom of the UPS module and the air exhaust on the top of the UPS module is free of obstructions.
- ▶ The optional maintenance bypass circuit breakers QB1 and CB2 (if present) are in the OFF (open) position.
- ▶ The battery disconnect circuit breaker QF1 is in the OFF (open) position.

Post-Start Up Safety Check List:

After initial start-up of the system, normal operation should be tested. At the minimum, the following tests should be performed as applicable to your installation.

- ▶ Emergency power off (EPO) test.
- ▶ Remote emergency power off (REPO) test (if applicable).
- ▶ Inverter start and stop.
- ▶ Battery transfer test.
- ▶ Maintenance bypass procedure.

3.0 Scope

Provides startup, shutdown, and normal operation of the Galaxy 3000 UPS. Included are pre and post startup safety checklists.

The Galaxy 3000 system is simple to operate and yet provides a wealth of continuous monitoring and diagnostic features to insure the proper operation of the unit.

Operators gain access to information in the Galaxy 3000 system through the operator interface. See Figure 3-2. This display panel and keyboard is conveniently located on the front of the UPS cabinet.

The Galaxy 3000 Operator Interface provides an easy to use method to access and control the Galaxy features. Through the use of four (4) soft keys and four (4) dedicated purpose keys, the operators can quickly move through the available displays, and a multitude of displays and menus to provide information about and capabilities to control the system. See Section 3.3 Operator Interface Screens.

3.1 Preparing for Startup

Before being able to use the operator interface to monitor and control your Galaxy 3000 system, a number of items should be verified to insure that all conditions will provide for safe operation. The following check lists are provided to aid in the successful pre and post start-up of the Galaxy 3000. They include items to verify prior to applying power, and then tests that should be performed (when appropriate) after startup to verify the health and functionality of all critical modules within the system.

Before starting the Galaxy 3000, read this Installation and Users Manual thoroughly. Be certain that you fully understand the operation of the indicators, controls, and operational sequences. MGE UPS SYSTEMS offers professional start up services in most countries. It is strongly suggested that before applying power to your Galaxy 3000, you contact MGE Field Services to properly commission your system.

3.1.1 Pre-Start Up Safety Check List

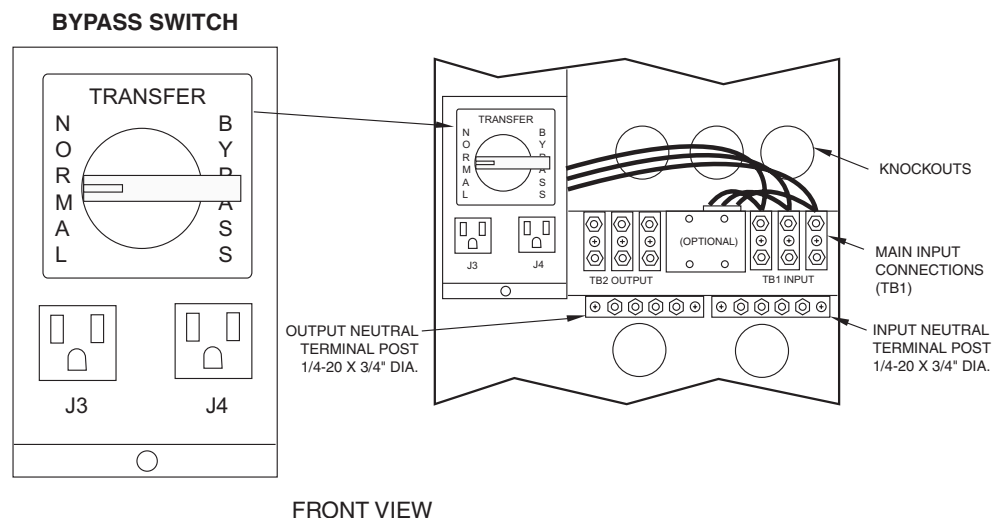
- ▶ Ensure all power and control wires have been properly connected and securely tightened.
- ▶ Check to see that the upstream and downstream protective devices are not tripped, and have been sized properly for the UPS and load requirements.
- ▶ Check that the input voltage is the same as indicated on the UPS nameplate, located inside the door of the Galaxy 3000 UPS module.
- ▶ Make certain that nothing is blocking the air intake underneath and around the front bottom of the UPS module and that the air exhaust on the top of the UPS module is free of all obstructions.
- ▶ Verify that the Manual Bypass Switch SR1 is set to the "NORMAL" position.
- ▶ If present, check to see that the optional maintenance bypass circuit breakers Q3BP and Q5N are in the OFF (open) position.
- ▶ Check to see that the battery disconnect circuit breaker QF1 is in the OFF (open) position.
- ▶ Check to see that the cabinet is resting on its lifting leveler jacks and are not on the 4 casters.
- ▶ Check that the load-circuit breakers (where applicable) are in the OFF position.

3.1.2 Normal Start Up Procedure

With all of the initial safety check lists verified, the Galaxy 3000 UPS system can now be powered. The following procedure should be used after the Galaxy 3000 UPS system has been commissioned (typically by an MGE Field Service Engineer).

1. Close upstream circuit breaker(s) which feed the UPS.
2. Rotate SR1 switch to transfer position and wait for 10 seconds. In this mode, the UPS will transfer from maintenance bypass to static switch (the inverter will start automatically only if the UPS is set for automatic start).
3. If inverter is on, then turn it off by pressing the gray button (See step 1 of Normal Shutdown Procedure in this page).
4. Rotate SR1 switch to normal position and close battery circuit breaker CB1 or QF1 (older UPS).
5. Press the green button to start the inverter. The Green LED will turn on.
6. The display will show the load is being protected (NORM Load Protected).

Figure 3-1: Bypass Switch.



3.1.3 Post Start Up Safety Check List

After initial start-up of the system, normal operation should be tested. At the minimum, the following tests should be performed as applicable to your installation.

- ▶ Emergency power off (EPO) test.
- ▶ Remote emergency power off (REPO) test (if applicable).
- ▶ Inverter start and stop.
- ▶ Battery transfer test.
- ▶ Maintenance bypass procedure.



CAUTION

As soon as AC input power is supplied to the Galaxy 3000 (customer supplied upstream circuit breaker is in the "ON" position), the load is initially supplied via the "Static Switch." Verify that no error indications are present on the operator interface panel.

3.1.4 Normal Shutdown Procedure

1. Press the gray (inverter off) button. The display will show "Confirm UPS Shutdown". Toggle the up and down scroll arrows button to "Yes" and press the return or enter button. The Yellow LED will turn on.
2. The UPS is now feeding the load from the static switch.
3. Open battery circuit breaker CB1, or QF1 (older UPS).
4. Rotate SR1 switch to bypass position.
5. At this point, the UPS is completely down, and the load is being protected through maintenance bypass.
6. To power down the load, open the upstream circuit breaker(s) which feed the UPS.

3.2 Operator Interface Screens

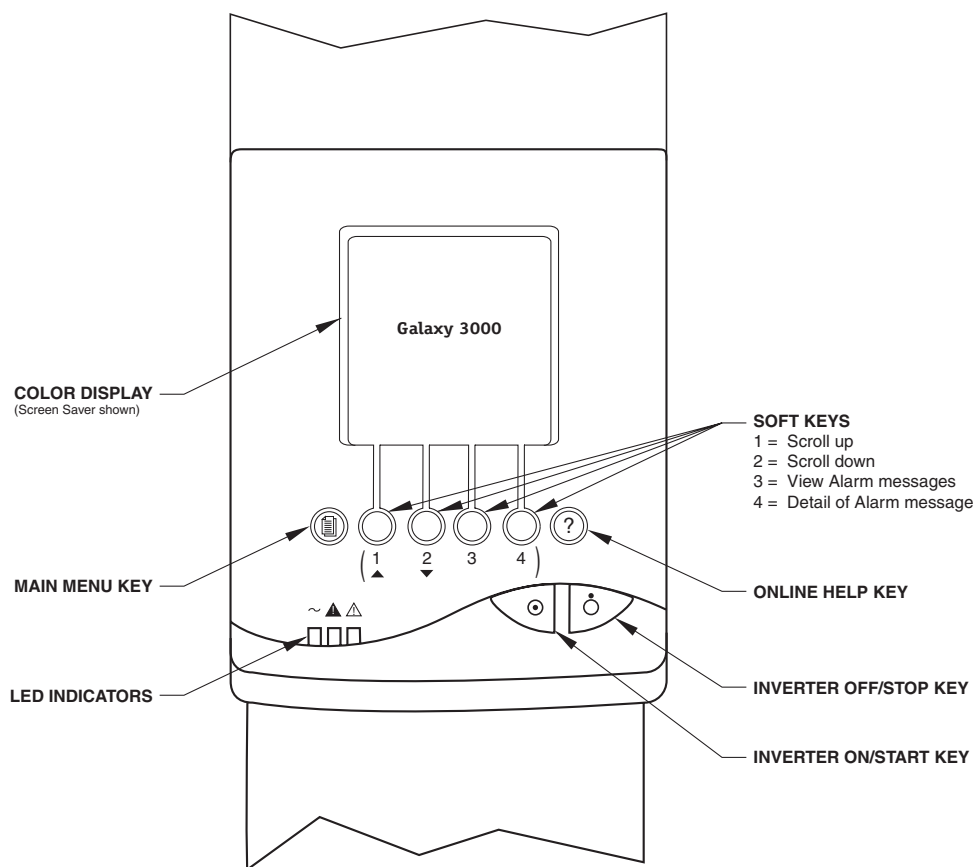
The operator interface screens contained on the Galaxy 3000 Operator Interface provide an easy to use method to access and control the Galaxy features.

The Soft Keys are now programmed to allow you to scroll up and down through the list of alarms. Although slightly different in operation, the detail key (soft key #4) must be held down to examine the message details.

The additional soft keys provide:

- Soft Key #1 - Multiple documents - indexing to the next Measurements display.
- to allow you to delete a specific alarm message
- Soft Key #2 - Up/Down arrows - moving the selection cursor to a measurement of interest
- or to allow you to examine in further detail a specific alarm message
- Soft Key #3 - Graph - Once a measurement of interest has been selected, this provides either a single measurement line chart or a multiple value graph
- Soft Key #4 - Magnifying glass - This key examines the selected variable(s).
- or to allow you to examine in further detail a specific alarm message

Figure 3-2: Operator Input Panel Indicators.

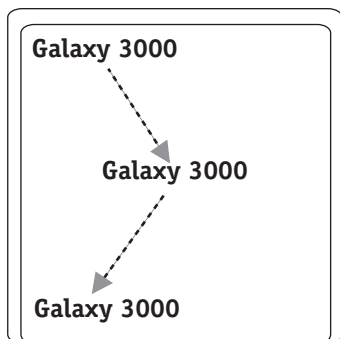


3.2.1 Screen Saver Display

When the Galaxy 3000 system has been in continuous operation, the operator interface will present a screen saver display. See Figure 3-2.

The product name, "Galaxy 3000", will be moving around the display screen to provide an indication that the unit is functional. See Figure 3-3.

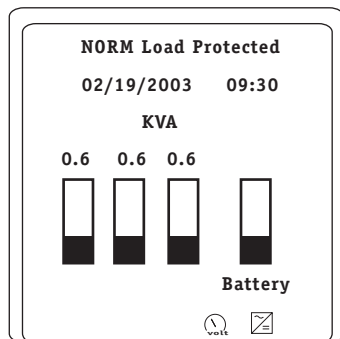
Figure 3-3: Screen Saver Movement within the display indicates the unit is active.



3.2.2 Operational Summary Display

Pressing any of the keys will cause the unit to provide an operational summary display with the following information. This display will quickly show the operator the time/date, the kVA load on all three phases, as well as the battery level.

Figure 3-4: Operational Summary Display.

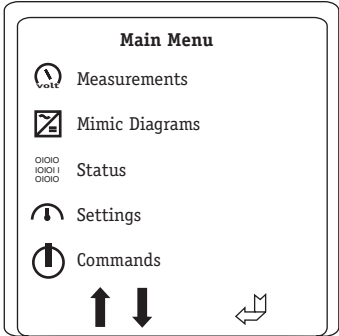


3.2.3 Main Menu Display

From **Main Menu** display the operator can access hundreds of different displays which will allow the ability to monitor the operating performance of Galaxy 3000, obtain alarm information, change operational settings as well as issue software based commands to various features in the unit.

The Main Menu displays conveniently grouped items according to function. By using one of the first two soft keys the selection cursor may be moved up and down unit the desired display group is selected. Then by pressing the fourth soft key, the selected display (or display group) will be summoned.

Figure 3-5: Main Menu.



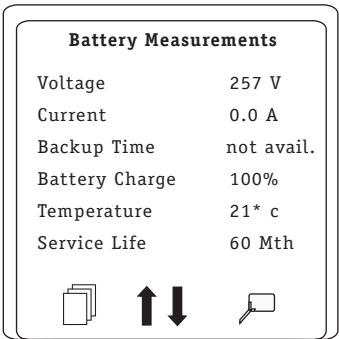
3.2.4 Battery Measurements Display

The **Battery Measurements** provides a rapid assessment of the available battery voltage, current, battery charge, temperature as well as expected service life. See Figure 3-6.

Any of these items may be examined further by using the soft key with the double arrows to select the item of interest and then pressing the soft key with the magnifying glass.

Pressing the soft key showing the multiple documents icon, will summon the next measurements display. In this case it will provide the **Power Measurements** display. See Figure 3-6.

Figure 3-6: Battery Measurements.

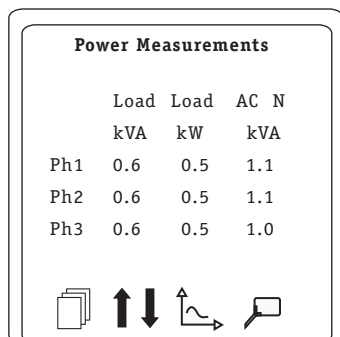


3.2.5 Power Measurements Display

From the **Power Measurements** display, we can see the power being required by the load on each phase displayed in kVA and in kW. Additionally, the source AC "normal" (AC N) is shown with the current kVA.

Pressing the key associated with the multiple documents icon, results in the **Current Measurements** display. See Figure 3-7.

Figure 3-7: Power Measurements.

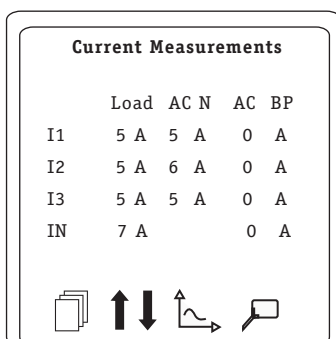


3.2.6 Current Measurements Display

From the **Current Measurements** display we can see the current being required by the two AC inputs (AC N and AC BP) as well as the current being required on each of the three phases of the load. See Figure 3-8.

Pressing Soft Key #1 results in the **Voltage Measurements** display. See Figure 3-9.

Figure 3-8: Current Measurements.

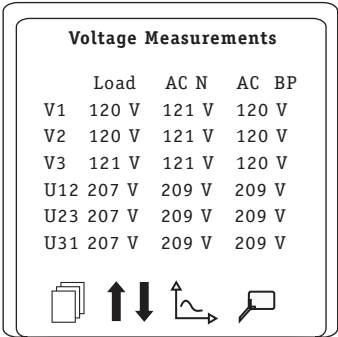


3.2.7 Voltage Measurements Display

From the **Voltage Measurements** display we can see the voltage currently on any one of the input phases (AC N and AC BP) and each phase of the load, as well as the differential voltage as measured between any two phases of the inputs and the load. See Figure 3-9.

Pressing Soft Key #1 results in the **Frequency Measurements** display. See Figure 3-10.

Figure 3-9: Voltage Measurements.

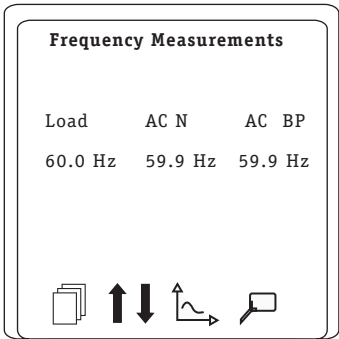


3.2.8 Frequency Measurements Display

From the **Frequency Measurements** display we can see the frequency currently on any one of the input lines (AC N and AC BP) and the frequency of the power being supplied to the load. See Figure 3-10.

Pressing Soft Key #1 results in the **Ratios** display. See Figure 3-11.

Figure 3-10: Frequency Measurements.



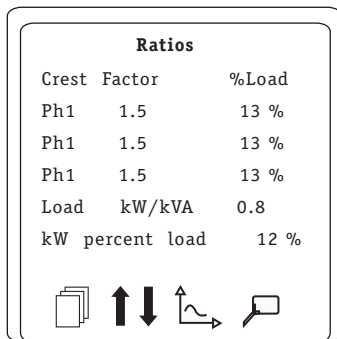
3.2.9 Ratios Display

From the **Ratios** display we can see the crest factor for each phase, the current % of full load for both each phase and for the total unit. Additionally, the load in kVA/kW is provided. See Figure 3-11.

Continuing to press the soft key #1 (Multiple Documents icon) will restart the display sequence of all of the measurement displays, i.e., battery, power, current, voltage, frequency and finally ratios.

At this point, it would be appropriate to press the **Main Menu** key and select the **Mimic Diagrams** item. This is done by pressing either soft key #1 or soft key #2 until the item is backlit, and then pressing soft key #4 to select the item for display. See Figure 3-11.

Figure 3-11: Ratios.



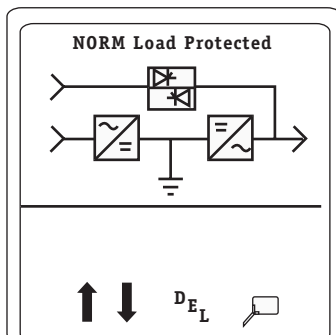
3.2.10 Mimic Diagrams

The **Mimic Diagrams** display is unlike any of the other display we have examined. This display is actually two displays in one. The top half of the display contains a single line representation of the current operating condition of the Galaxy 3000 unit. Through the use of color changes in the display, it will indicate whether the unit is operating normally, is on bypass, or is currently running on batteries. The lower half of the display will show any existing alarm conditions that are present.

To exit this display, it is necessary to press the **Main Menu** key.

From the **Main Menu** we can select the **Status** option. See Figure 3-12.

Figure 3-12: Mimic Diagram.



3.2.11 Status Displays Menu

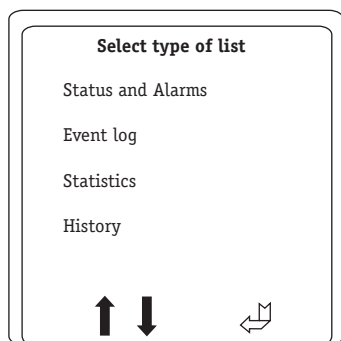
Selecting the **Status** option from the **Main Menu** results in another list of available displays.

These displays include: Status and Alarms, Event Log, Statistics, History. See Figure 3-13.

The Soft Keys have been programmed to allow you to highlight one of these available displays and then to select it (by pressing soft key #4). These available displays are lists of events, actions, and statistics and will not be examined in further detail within this manual. It is left for the operator to display and examine these lists.

Again, to exit the **Status** displays menu, it is necessary to press the dedicated **Main Menu** key. From here we can select the **Settings** option. See Figure 3-14.

Figure 3-13: Status Displays Menu.

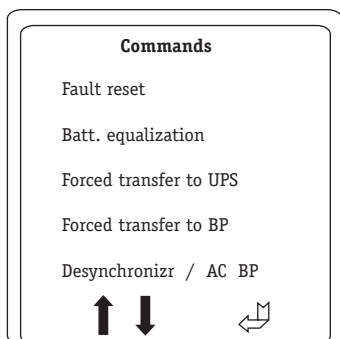


3.2.12 Commands Menu

Similar to the **Personalization** section, the **Commands** menu presents options that impact the operation of the UPS system. Extreme care should be exercised when selecting ANY of these menu options. The **Commands** menu provides the following:

- ▶ Fault reset
- ▶ Battery equalization
- ▶ Forced transfer to UPS
- ▶ Forced transfer to BP (Bypass)
- ▶ Desynchronize / AC BP

Figure 3-14: Commands Menu.



3.2.13 Settings Menu

From the **Settings** menu, we can select a variety of options for the operation of the Galaxy 3000 system. See Figure 3-15.

Four (4) options are:

Language	With an opportunity for the Galaxy 3000 unit to be located in any country, it is possible to select the language of preference from several options.
Date/Time	Can be set to insure that the time stamps on the event and alarm logs reflect the current local time and date.
Contrast	Allows the contrast of the operator interface unit to be adjusted to maximize its visibility in the current ambient lighting conditions.
Buzzer	Allows the volume of the buzzer to be set.
Personalization	Allows the operator to select any number of operating parameters for the UPS.

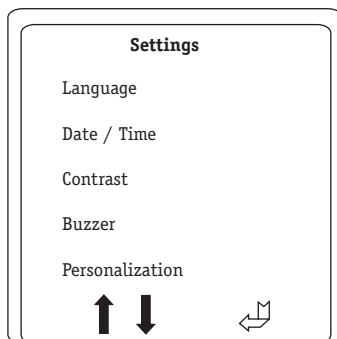


NOTE:

Do NOT adjust any parameters in the personalization section without a clear understanding of the implications to your operation. Should there be any questions about a current setting, please do not hesitate to contact the Customer Support Center at MGE UPS Systems, Inc.

Returning to the **Main Menu**, select the final option, **Commands**. See Figure 3-15.

Figure 3-15: Settings Menu.



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4.0 Scope

Describes maintenance and safety information on servicing batteries for the Galaxy 3000.

4.1 Servicing Batteries

IMPORTANT SAFETY INSTRUCTIONS FOR SERVICING BATTERIES

Servicing of batteries should be performed or supervised by personnel knowledgeable of batteries and the required precautions. Keep unauthorized personnel away from batteries.

When replacing batteries, use the same model and manufacturer of batteries.



CAUTION:

Do not dispose of battery or batteries in a fire. The battery may explode. Do not open or mutilate the battery or batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic. A battery can present a risk of electrical shock and high short-circuit current.

The following precautions should be observed when working with batteries:

- ▶ Remove watches, rings, or other metal objects.
- ▶ Use tools with insulated handles.
- ▶ Wear rubber gloves and boots.
- ▶ Do not lay tools or metal parts on top of batteries.
- ▶ Disconnect charging source prior to connecting or disconnecting battery terminals.
- ▶ Determine if the battery is inadvertently grounded. If inadvertently grounded, remove the source of ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock will be reduced if such grounds are removed during installation and maintenance.

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MGE Warranty & Proprietary Rights for Three Phase Products

MGE Warranty

The liability of MGE UPS SYSTEMS, INC. hereunder is limited to replacing or repairing at MGE UPS SYSTEMS, INC.'s factory or on the job site at MGE UPS SYSTEMS, INC.'s option, any part or parts which are defective, including labor, for a period of 12 months from the date of purchase. The MGE UPS SYSTEMS, INC. shall have the sole right to determine if the parts are to be repaired at the job site or whether they are to be returned to the factory for repair or replacement. All items returned to MGE UPS SYSTEMS, INC. for repair or replacement must be sent freight prepaid to its factory. Purchaser must obtain MGE UPS SYSTEMS, INC.'s Return Materials Authorization prior to returning items. The above conditions must be met if warranty is to be valid. MGE UPS SYSTEMS, INC. will not be liable for any damage done by unauthorized repair work, unauthorized replacement parts, from any misapplication of the item, or for damage due to accident, abuse, or Act of God.

In no event shall the MGE UPS SYSTEMS, INC. be liable for loss, damage, or expense directly or indirectly arising from the use of the units, or from any other cause, except as expressly stated in this warranty. MGE UPS SYSTEMS, INC. makes no warranties, express or implied, including any warranty as to merchantability or fitness for a particular purpose or use. MGE UPS SYSTEMS, INC. is not liable for and Purchaser waives any right of action it has or may have against MGE UPS SYSTEMS, INC. for any consequential or special damages arising out of any breach of warranty, and for any damages Purchaser may claim for damage to any property or injury or death to any person arising out of its purchase of the use, operation or maintenance of the product. MGE UPS SYSTEMS, INC. will not be liable for any labor subcontracted or performed by Purchaser for preparation of warranted item for return to MGE UPS SYSTEMS, INC.'s factory or for preparation work for field repair or replacement. Invoicing of MGE UPS SYSTEMS, INC. for labor either performed or subcontracted by Purchaser will not be considered as a liability by the MGE UPS SYSTEMS, INC.

This warranty shall be exclusive of any and all other warranties express or implied and may be modified only by a writing signed by an officer of the MGE UPS SYSTEMS, INC. This warranty shall extend to the Purchaser but to no one else. Accessories supplied by MGE UPS SYSTEMS, INC., but manufactured by others, carry any warranty the manufacturers have made to MGE UPS SYSTEMS, INC.. and which can be passed on to Purchaser.

MGE UPS SYSTEMS, INC. makes no warranty with respect to whether the products sold hereunder infringe any patent, U.S. or foreign, and Purchaser represents that any specially ordered products do not infringe any patent. Purchaser agrees to indemnify and hold MGE UPS SYSTEMS, INC. harmless from any liability by virtue of any patent claims where Purchaser has ordered a product conforming to Purchaser's specifications, or conforming to Purchaser's specific design.

Purchaser has not relied and shall not rely on any oral representation regarding the Product sold hereunder and any oral representation shall not bind MGE UPS SYSTEMS, INC. and shall not be part of any warranty.

There are no warranties which extend beyond the description on the face hereof. In no event shall MGE UPS SYSTEMS, INC. be responsible for consequential damages or for any damages except as expressly stated herein.

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Warranty and Product Registration

Thank you for choosing MGE UPS SYSTEMS, INC. for your power protection, distribution, and quality requirements. We are pleased to have you join our increasing family of users.

In order to maximize the value you receive from this product, and to ensure that you are kept informed of product or software updates, we recommend that you take a few minutes to register your new purchase. You may register online at the URL noted below. Should you not have Internet access, you may mail or fax this form back (attn: Warranty Registration) as indicated at the bottom of the page.

Register your UPS at: <http://www.mgeups.com/email/warranty/menu.htm>

Please be prepared with the following information to register and validate your UPS warranty, keep informed on software and product updates, and register your extension "Warranty+" if purchased with the UPS.

User Information

Last name _____
First name _____
Company name _____
Address _____
Zip code _____
City _____
State/Province _____
Country _____
Tel _____
Fax * _____
Email* _____

Product information

Model _____
Serial Number _____
Date of purchase _____

Warranty Extension (Warranty+) not available on products

I have purchased a warranty extension (Warranty+)

Reference: _____ Contract Number: _____

Thank you from all of us at MGE.

MGE Customer Care Center

Technical Support and Product Services



Technical questions? If you encounter a problem while following the instructions in this manual, or have questions about the operation, repair, or servicing of your equipment, please direct calls to MGE UPS SYSTEMS, INC. Customer Care Center or visit our web site www.mgeups.com for complete service information.

To insure that your questions are correctly answered, please obtain the part number, assembly number, and serial number of the unit and include them in any discussions or correspondence.

Part Number: _____

Assembly Number: _____

Serial number: _____

Who To Contact

Technical Support: **1-800-523-0142** (during business hours)

Customer Care Center: **1-800-438-7373** (Hours: 24/7)

**Customer FAQ
or International calls:** **1-714-557-1636**

Commitment: MGE UPS SYSTEMS, INC. is committed to providing easy to access factory trained experts that will provide responses to any questions that you might have.

Scheduling Field Service Engineer Support

Scheduling of the MGE Field Service Engineers typically should be done 7 to 10 days before they are required on-site. If the startup of the UPS is critical to maintaining your schedule, please call the MGE toll free telephone number at **1-800-438-7373**, to insure a safe installation and startup that will maintain the MGE warranty and insure smooth performance

Return Policy for Repair (RMA)

Should you require factory service for your equipment, contact MGE's Customer Support Services and obtain a Return Materials Authorization (RMA) prior to shipping your unit. Never ship equipment to MGE without first obtaining an RMA.

Date: _____

RMA Number: _____

Contact Name: _____

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Term used	Definition / Meaning
@	At.
/	And/or.
+/-	Plus or Minus.
≤	Equal to or less than.
#	Number.
°C	Degree Celsius.
°F	Degree Fahrenheit.
Ø	Phase angle.
Ω	Ohm; unit of resistance.
®	Trade Mark.
2nd	Second.
ABC	Normal sequence of phases in three phase power.
AC or ac	Alternating current, also implies root-mean-square (rms).
Ambient Temp.	Temperature of surrounding air.
Ambient noise	Acoustical noise of surrounding environment.
ANSI	American National Standard Institute.
AWG	American Wire Gauge. A standard unit for measuring wire cross-sectional area.
Breaker	Electrical circuit interrupter.
BTU or Btu	British thermal unit. Defined as the amount of heat required to raise the temperature of one pound of water by 1°F.
BYPASS mode	Load is powered by the Bypass input line through the static switch.
Carrier	The company or individual responsible for delivering goods from one location to another.
CB	Circuit breaker.
CB1	Battery disconnect circuit breaker.
cm	Centimeter.
Conduit	A flexible or rigid tube enclosing electrical conductors.
Current rating	The maximum current that a conductor or equipment can carry reliably without damage.
dB	Decibels.
dBA	Decibel Adjusted.

DC or dc	Direct current, or voltage.
Digital Meter	The LCD display on the front panel of inverter system.
Earth ground	A ground circuit that has contact with the earth.
ECO Mode	Operating mode by which the load is supplied directly by the AC source if it is within the tolerances defined by the user. This mode reduces the consumption of electrical power.
Electrician	Refers to an installation electrician qualified to install high-energy electrical components in accordance with national and local codes and regulations. Not necessarily qualified to maintain or repair electrical or electronic equipment. Compare to Technician.
EPO	Emergency Power Off. Used to switch all UPS/critical power OFF. For emergency power shutdown only.
Frequency slew rate	The change in frequency per unit of time. Given in term of Hz per second (Hz/sec.).
GND	Electrical ground.
Hz	Hertz, frequency measurement unit, 1Hz is one cycle per second.
Inverter mode	See “on-line” mode.
I	Current.
IEC	International Electrotechnical Commission.
IEEE	Institute of Electrical and Electronic Engineers.
Input branch circuit	The input circuit from the building power panel to the equipment.
Inverter	An electrical circuit that generates an AC voltage source from a DC voltage source.
IGBT	Insulated gate bipolar transistors.
I/O	Input/Output.
I/T or IT	Information Technology.
kVA	KiloVolt-Ampere; is equal to 1000 Volt-Ampere.
kW	True power. Kilo-Watt = 1000 Watt.
L	Line.
LCD	Liquid-Crystal Display.
LED	Light Emitting Diode.
Mains or Mains 1	Main AC input source.
Mains 2	Bypass AC input source.
mA	Milliampere.
MAX.	Maximum.
MCM	Thousand circular mil; standard wire sizes for multiple stranded conductors over 4/0 AWG in diameter. M is from Roman numerical system indicating 1000.
Module	Refers to individual power inverter module.
N	Neutral.
NC	Normally closed.
NO	Normally open.
NEC	National Electrical Code.

NFPA	National Fire Protection Association.
PN	Part number.
On-line mode	Inverter output power is the primary energy source to load.
Off-line mode	Inverter output is off, and the load connected at the inverter output receives power from utility line via a static transfer switch or maintenance bypass relay.
OSHA	Occupational Safety and Health Agency.
PCA	Printed circuit assembly.
PCB	Printed circuit board.
PWM	Pulse Width Modulation.
Q1	UPS input isolation switch.
Q3BP	Optional maintenance switch.
Q4S	Control or bypass switch.
Q5N	UPS isolation circuit breaker or switch.
Remote Emergency Power Off	A switch used for shutting down electrical equipment from a location away from the equipment.
REPO	Remote Emergency Power Off.
SCR	Silicon controlled rectifier.
Shipping damage	Any damage done to an article while it is in transit.
SCR	Silicon controlled rectifier.
Shipping Pallet	A platform on which articles are fixed for shipping.
Static Transfer	An solid state switching mechanism electronically controlled to pass AC power directly from the utility to an output load.
Technician	Refers to an electronic technician qualified to maintain and repair electronic equipment. Not necessarily qualified to install electrical wiring.
Test connector	DB-9 type connector on the LCD panel allowing MGE UPS SYSTEMS Customer Support Service technician to access programmable and diagnostic features of the system.
UL	Underwriter's Laboratories, Inc.
V	Volts
VA	Volt-amperes, unit for apparent power measurement, equal $V \times I$.
Vac	Voltage of AC type.
Vdc	Voltage of DC type.

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Reorder Form



**1660 Scenic Avenue
Costa Mesa, CA 92626**

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NAME _____

COMPANY _____

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I would like to order _____ (quantity @ \$75.00 each) additional copies of the:

Galaxy 3000 10-30kVA

Installation and User Manual

86-172010-00 C05

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